

IN THE CLAIMS

Please amend the claims as follows:

1.(currently amended) A method of reducing formation of as-cast metallic surface scale on making a single crystal casting during its solidification in a mold wherein the metallic surface scale includes one or more of a eutectic phase or secondary alloy phase metallurgically bonded to the casting, comprising

providing a nickel base superalloy that includes Cr, Co, Mo, W, Ta, and Al as alloying elements and that exhibits said as-cast metallic surface scale when the superalloy is cast solidified as a single crystal casting in a mold, including providing said superalloy with a C concentration effective to substantially reduce formation of said as-cast metallic surface scale, and

solidifying the superalloy in a mold to form a single crystal casting.

2.(original) The method of claim 1 wherein said nickel base superalloy includes at least one of Ti, Re, Hf, Y, a rare earth element, Mg, and B.

3.(original) The method of claim 1 wherein the superalloy as-cast is free of said scale.

4.(original) The method of claim 1 including solution heat treating the casting wherein recrystallized grains are reduced after heat treatment.

5.(currently amended) A method of reducing formation of as-cast metallic surface scale on making a single crystal casting during its solidification in a mold wherein the metallic surface scale includes one or more of a eutectic phase or secondary alloy phase metallurgically bonded to the casting, comprising

providing a nickel base superalloy consisting essentially of, in weight %, about 6% to 6.8% Cr, about 8% to 10% Co, about 0.5% to 0.7% Mo, about 5.0% to 6.6% W, about 6.3% to 7% Ta, about 5.4% to 5.8% Al, about 0.6% to 1.2% Ti, about 0.05% to 0.3% Hf, up to about 100 ppm by weight B, up to 50 ppm by weight Mg, and ~~balance~~ balance essentially Ni that exhibits as-cast metallic surface scale when the superalloy is ~~cast~~ solidified as a single crystal casting in a mold, including providing said superalloy with a C concentration greater than 0.04 weight % effective to substantially reduce formation of ~~[[an]]~~ said as-cast metallic scale when the superalloy is ~~cast~~ solidified as a single crystal casting, and

solidifying the superalloy in a mold to form a single crystal casting.

6.(original) The method of claim 5 wherein the superalloy as-cast is free of said scale.

7.(original) The method of claim 5 including solution heat treating the casting wherein recrystallized grains are reduced after heat treatment.

8.(original) The method of claim 5 wherein C is included in an amount of greater than 0.04% to about 0.1% by weight.

9.(currently amended) A ~~methed~~ method of reducing formation of as-cast metallic surface scale on making a single crystal casting during its solidification in a mold wherein the metallic surface scale includes one or more of a eutectic phase or secondary alloy phase metallurgically bonded to the casting, comprising

providing a nickel base superalloy including Cr, Co, Mo, W, Ta, and Al as alloying elements that exhibits as-cast metallic surface scale when the superalloy is ~~cast~~ solidified as a single crystal casting in a mold, including providing said superalloy with a C concentration controlled in accordance with the equation,

$$\% \text{ area fraction scale} = -0.193 \times \text{carbon content in ppm} + 86$$
for C concentration up to 450 ppm by weight effective to substantially reduce formation of an as-cast metallic surface scale when the superalloy is ~~cast~~ solidified as a single crystal casting in a mold, and

solidifying the superalloy in a mold to form a single crystal casting.

10.(original) The method of claim 9 including heat treating the casting wherein recrystallized grains are reduced after heat treatment.

11.(original) The method of claim 9 wherein said superalloy includes at least one of Ti, Re, Hf, Y, a rare earth element, B, Mg, and B.

12.-16.(canceled)

17.(currently amended) A method of reducing grain recrystallization in making a single crystal casting, comprising providing a nickel base superalloy that includes Cr, Co, Mo, W, Ta, and Al as alloying elements and that exhibits grain recrystallization when the superalloy is solution heat treated after solidification, including providing said superalloy with a C concentration before solidification effective to substantially reduce grain recrystallization during heat treating, and solution heat treating the superalloy.

18.(original) The method of claim 17 wherein said nickel base superalloy includes at least one of Ti, Re, Hf, Y, a rare earth element, Mg, and B.

19.(currently amended) The method of claim 17 wherein said nickel base superalloy consisting essentially of, in weight %, about 6% to 6.8% Cr, about 8% to 10% Co, about 0.5% to 0.7% Mo, about 5.0% to 6.6% W, about 6.3% to 7% Ta, about 5.4% to 5.8% Al, about 0.6% to 1.2% Ti, about 0.05% to 0.3% Hf, up to about 100 ppm by weight B, up to 50 ppm by weight Mg, greater than ~~0.4%~~ 0.04% C, and balance essentially Ni.

20.(original) The method of claim 17 wherein the Hf content is from about 0.15 to about 0.30 weight %.